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Positron analysis of 1, 2, and 3 dimensional Fermi surfaces in HTS materials, R. HOWELL, Lawrence Livermore National Laboratory and P. STERNE, Lawrence Livermore National Laboratory and UC Davis --Positron analysis has made significant contributions to the understanding of high temperature superconductivity by determining Fermi surfaces in cases that have been difficult for other probes. We will describe the results of combined experimental and theoretical studies on three systems: YBCO, LSCO and BKBO all of which contain examples of significant Fermi surface features. In YBCO clear evidence of the Fermi surface associated with the one dimensional copper oxygen chains was seen. In LSCO the Fermi surface of a single, two dimensional, copper oxygen plane was determined. Effects of electron correlation were seen in the response of the LSCO Fermi surface to levels of Sr doping. In BKBO a three dimensional Fermi surface with large, flat features was obtained. The relationship of these results to general considerations in high temperature superconductivity and data from complementary techniques will be discussed and areas of special impact to high temperature superconductivity will be highlighted. This work was performed under the auspices of the U.S. Department of Energy by LLNL under contract No. W-7405-ENG-48.